

CATALOG DOCUMENTATION
REGIONAL ENVIRONMENTAL MONITORING AND ASSESSMENT PROGRAM - REGION 1
1993-1994 FISH TISSUE CONTAMINATION IN MAINE LAKES
LAKE AREAS AND VOLUMES

TABLE OF CONTENTS

1. DATA SET IDENTIFICATION
2. INVESTIGATOR INFORMATION
3. DATA SET ABSTRACT
4. OBJECTIVES AND INTRODUCTION
5. DATA ACQUISITION AND PROCESSING METHODS
6. DATA MANIPULATIONS
7. DATA DESCRIPTION
8. GEOGRAPHIC AND SPATIAL INFORMATION
9. QUALITY CONTROL/QUALITY ASSURANCE
10. DATA ACCESS
11. REFERENCES
12. TABLE OF ACRONYMS
13. PERSONNEL INFORMATION

1. DATA SET IDENTIFICATION

1.1 Title of Catalog document

Regional Environmental Monitoring and Assessment Program - Region 1
1993-94 Fish Tissue Contamination in Maine Lakes
Lake Areas and Volumes

1.2 Author of the Catalog entry

Melissa Hughes, OAO Corporation

1.3 Catalog revision date

9 March 1998

1.4 Data set name

AREA_VOL

1.5 Task Group

Region 1

1.6 Data set identification code

00002

1.7 Version

001

1.8 Requested Acknowledgment

If you plan to publish these data in any way, EPA requires a standard statement for work it has supported:

"Although the data described in this article have been funded wholly or in part by the U. S. Environmental Protection Agency through its Regional EMAP program, it has not been subjected to Agency review, and therefore does not necessarily reflect the views of the Agency and no official endorsement should be inferred."

2. INVESTIGATOR INFORMATION

2.1 Principal Investigators

Barry Mower
Jeanne DiFranco
Linda Bacon
David Courtemanch
State of Maine Department of Environmental Protection

2.2 Investigation Participant-Sample Collection

Not applicable

3. DATA SET ABSTRACT

3.1 Abstract of the Data Set

The R-EMAP Region 1 Lake Areas and Volumes data set contains areas and volumes of each lake which fall into several categories: Anoxic, Warm Water and Total. Estimates of water volume and sediment area exposed to warm water and anoxic conditions may affect a fish's or lake's sensitivity to contamination.

3.2 Keywords for the Data Set

Lake, Maine, surface water, anoxic sediment area, anoxic volume, total lake area, total lake volume, warm water sediment area, warm water volume

4. OBJECTIVES AND INTRODUCTION

4.1 Program and Project Objectives

4.1.1 Program Objective

Regional Environmental Assessment and Monitoring Program (R-EMAP) was initiated to test the applicability of the EMAP approach to answer questions about ecological conditions at regional and local scales. Using EMAP's statistical design and indicator concepts, R-EMAP conducts projects at smaller geographic scales and in shorter time frames.

4.1.2 Project Objective

The primary goal of this study was to estimate the levels of contamination in fish populations, and the risk these levels pose to human and wildlife consumers. The primary objective was to determine concentrations of cadmium, lead, mercury, PCBs and selected pesticides in fish collected from Maine lakes.

4.2 Data Set Objective

Profiles were taken at the deepest depth of each lake in order to estimate the lake anoxic, warm water and total areas and volumes.

4.3 Data Set Background Discussion

From a population of 1800 Maine lakes that have been surveyed by the Maine DIFW and have principal fisheries, one hundred and fifty lakes were selected using the EMAP sampling design and 125 were sampled. Correlations with factors that may affect a fish's or lake's sensitivity to contamination were examined secondarily. These factors include species, size, age, geography, geology, water and sediment chemistry, hydrology, trophic state and air flow patterns. The results will be used to develop preventive actions and management techniques.

4.4 Summary of Data Set Parameters

Dissolved oxygen measurements were taken from a vertical profile, either in the field or historic. Other parameters, the areas and volumes, were calculated, based on these data.

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition

5.1.1 Sampling Objective

Collect accurate dissolved oxygen and depth measurements at the deepest part of each lake or pond.

5.1.2 Sample Collection Methods Summary

DIFW bathymetric maps were used to determine the deepest part of each lake. The YSI 6000 Multiprobe was allowed to equilibrate, then the sonde was deployed to measure and record profiles for dissolved oxygen at one, two or five meter intervals.

5.1.3 Sampling Start Date

June 1993
September 1994

5.1.4 Sampling End Date

September 1993
September 1994

5.1.5 Platform

Not applicable.

5.1.6 Sampling Equipment

YSI 6000 Multiprobe with an Omnidata PC-286LX

5.1.7 Manufacturer of Sampling Equipment

Not known

5.1.8 Key Variables

Data for dissolved oxygen and depth were collected in the field. Some historic IF&W/DEP profiles were used for warm water depth determination.

Not applicable.

Water samples were collected first to ensure an undisturbed water column.

5.1.11 Sample Collection Method Reference

Maine Department of Environmental Protection et al. 1993. Project Work/Quality Assurance Plan, Fish Tissue Contamination in the State of Maine. Maine Department of Environmental Protection, Maine Department of Inland Fisheries and Wildlife and USEPA Region 1 Environmental Services Division. December 20, 1993.

Not applicable

6.1 Name of new or modified values

6.2 Data Manipulation Description

6.3 Data Manipulation Examples

Not applicable.

7.1 Description of Parameters

```
Data Set Name: AREA_V0L      Observations:      125
Engine:      V612           Variables:         11
```

#	Parameter SAS Name	Data Type	Len	Format	Parameter Label
1	MIDAS	Num	8	7.	Lake identification number
2	ZMAX	Num	8	6.1	Maximum depth of lake
3	AREA	Num	8	11.1	Surface area of lake (m2)
4	VOL	Num	8	15.1	Volume of lake (m3)
5	ZLOW	Num	8	6.1	Depth where D.O. falls below 1.0 (anoxic)
6	ANOXAREA	Num	8	11.1	Sediment area exposed to anoxia (m2)
7	ANOXVOL	Num	8	10.1	Volume of anoxic water (m3)

7.1 Description of Parameters, continued

#	Parameter SAS Name	Data Type	Len	Format	Parameter Label
8	ZWARM	Num	8	7.1	Deepest depth of water >=20 degrees C (warm)
9	WARMAREA	Num	8	12.1	Sediment area exposed to warm water (m2)
10	WARMVOL	Num	8	14.1	Volume of warm water (m3)
11	FLAG	Char	6	\$6.	* Indicates historic IF&W/DEP profiles used for warm water depth determination; D=shallow lake, whole water column assumed to be warm

7.1.6 Precision to which values are reported

Areas and volumes are estimated to one decimal place.

7.1.7 Minimum value in data set

Variable	Minimum
ZMAX	1.5
AREA	26742.0
VOL	55869.3
ZLOW	3.0
ANOXAREA	0.0
ANOXVOL	0.0
ZWARM	1.0
WARMAREA	11880.0
WARMVOL	26224.8

7.1.8 Maximum value in data set

Variable	Maximum
ZMAX	48.2
AREA	58335336.0
VOL	706658746.0
ZLOW	37.2
ANOXAREA	9130000.0
ANOXVOL	40864437.7
ZWARM	12.0
WARMAREA	33788292.0
WARMVOL	406787558.0

7.2 Data Record Example

7.2.1 Column Names for Example Records

MIDAS;ZMAX;AREA;VOL;ZLOW;ANOXAREA;ANOXVOL;ZWARM;WARMAREA;WARMVOL;FLAG;

7.2.2 Example Data Records

MIDAS;ZMAX;AREA;VOL;ZLOW;ANOXAREA;ANOXVOL;ZWARM;WARMAREA;WARMVOL;FLAG;
41;2.4;1666632.0;1482688.6;99.9;0.0;0.0;2.4;1666632.0;1482688.6;D;
78;48.2;6271276.0;113290006.0;99.9;0.0;0.0;7.1;1035414.0;40282405.2; ;
159;11.0;1397584.0;7465046.6;10.5;0.0;0.0;7.6;1234027.0;7269897.2; ;
177;11.6;27177641.0;119332028.0;99.9;0.0;0.0;7.3;22077641.0;114308496.0; ;
202;13.1;867272.0;3638805.5;9.0;74087.0;119087.1;5.0;567272.0;2842373.6; ;

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude

-71 Degrees 00 Minutes 47 Decimal Seconds

8.2 Maximum Longitude

-67 Degrees 10 Minutes 30 Decimal Seconds

8.3 Minimum Latitude

43 Degrees 15 Minutes 21 Decimal Seconds

8.4 Maximum Latitude

47 Degrees 07 Minutes 11 Decimal Seconds

8.5 Name of area or region

EPA Region 1

The sampling area included the entire state of Maine.

9. QUALITY CONTROL AND QUALITY ASSURANCE

9.1 Data Quality Objectives

Water profile duplicates should have no more than a 30% relative percent difference.

9.2 Data Quality Assurance Procedures

All 1 meter water profile duplicates had a relative percent difference less than 30%, except one sample each for specific conductance and pH.

10. DATA ACCESS

10.1 Data Access Procedures

Data can be downloaded from the WWW site or contact personnel listed in Section 10.3.

10.2 Data Access Restrictions

Not Applicable

10.3 Data Access Contact Persons

Linda C. Bacon
State of Maine Department of Environmental Protection
Bureau of Land and Water Quality
Division of Environmental Assessment
State House Station 17
Augusta, ME 04333
Linda.C.Bacon@state.me.us

Data Librarian EMAP-Information Management
U.S. EPA NHEERL-AED
(401) 782-3184 (Tele)
(401) 782-3030 (FAX)
hughes.melissa@epa.gov

10.4 Data Set Format

Data files are in ASCII semi-colon delimited format.

10.5 Information Concerning Anonymous FTP

Data cannot be accessed via ftp.

10.6 Information Concerning WWW

Data can be downloaded from the WWW site.

10.7 EMAP CD-ROM Containing the Data Set

Data are not available on CD-ROM

11. REFERENCES

DiFranco et. al., 1995. Fish Tissue Contamination in Maine Lakes. Data Report. State of Maine Department of Environmental Protection, Bureau of Land and Water Quality, Division of Environmental Assessment. September 1995.

Maine Department of Environmental Protection et al. 1993. Project Work/Quality Assurance Plan, Fish Tissue Contamination in the State of Maine. Maine Department of Environmental Protection, Maine Department of Inland Fisheries and Wildlife and USEPA Region 1. December 20, 1993.

12. TABLE OF ACRONYMS

ACRONYM	DESCRIPTION
DEP	Maine Department of Environmental Protection
DIFW	Maine Department of Inland Fisheries and Wildlife
EMAP	Environmental Monitoring and Assessment Program
EPA	Environmental Protection Agency
HetL	Maine Department of Human Services Health and Environmental Testing Laboratory
MIDAS	Maine Information Display Analysis System - unique number assigned to each Maine lake
PCBs	polychlorinated biphenyls
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
REMAP	Regional Environmental Monitoring and Assessment Program
UMO	National Biological Survey and Sawyer Environmental Chemistry Laboratories at the University of Maine at Orono

13. PERSONNEL INFORMATION

Jeanne DiFranco
Linda Bacon
David Courtemanch
Barry Mower
State of Maine Department of Environmental Protection
Bureau of Land and Water Quality
Division of Environmental Assessment
State House Station 17
Augusta, ME 04333
(207) 287-3901
Barry.F.Mower@state.me.us
Jeanne.L.Difranco@state.me.us
Linda.C.Bacon@state.me.us
Dave.L.Courtemanch@state.me.us

Melissa M. Hughes
EMAP-Information Management
OA0 Corp. c/o U.S. EPA NHEERL-AED
27 Tarzwell Drive
Narragansett, RI 02882-1197
(401) 782-3184 (Tele)
(401) 782-3030 (FAX)
hughes.melissa@epa.gov

Ray Thompson
U.S. EPA - Region 1
Environmental Services Division
60 Westview Street
Lexington, MA 02173
(781) 860-4300 (Tele)
thompson.ray@epa.gov